IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

GLOBALFOUNDRIES U.S. INC. Plaintiff, v. TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY LTD., TSMC NORTH AMERICA., TSMC TECHNOLOGY, INC., MEDIATEK INC., MEDIATEK USA INC., MSTAR SEMICONDUCTOR, INC., HISENSE CO., LTD., HISENSE ELECTRIC CO., LTD., HISENSE INTERNATIONAL CO., LTD., HISENSE GROUP CO., LTD., QINGDAO HISENSE COMMUNICATION CO., LTD., and HISENSE IMPORT & EXPORT CO. LTD. Defendants.	**Case No. 6:19-cv-00490** **JURY TRIAL DEMANDED**

COMPLAINT

Plaintiff Globalfoundries U.S. Inc. ("Globalfoundries" or "Plaintiff") brings this patent infringement action against Defendants Taiwan Semiconductor Manufacturing Company Ltd., TSMC North America, TSMC Technology, Inc. (collectively, "TSMC"), MediaTek Inc., MediaTek USA Inc., MStar Semiconductor, Inc. (collectively, "MediaTek"), Hisense Co., Ltd., Hisense Electric Co., Ltd., Hisense International Co., Ltd., Hisense Group Co., Ltd., Qingdao Hisense Communication Co., Ltd., and Hisense Import & Export Co. Ltd. (collectively, "Hisense") (collectively, "Defendants") as follows:

NATURE OF THE ACTION

1. This is a civil action for infringement of United States Patent Nos. 8,581,348 ("'348 patent"), 9,355,910 ("'910 patent"), 7,425,497 ("'497 patent"), 8,598,633 ("'633 patent"), 6,518,167 ("'167 patent"), and 8,039,966 ("'966 patent") (collectively, the "Asserted Patents") under the patent laws of the United States, 35 U.S.C. § 1 *et seq*.

THE PARTIES

2. Plaintiff Globalfoundries U.S. Inc. is a Delaware corporation with its principal place of business at 2600 Great America Way, Santa Clara, California 95054.

3. Defendant Taiwan Semiconductor Manufacturing Company Ltd. is a company organized under the laws of Taiwan with its principal place of business at 8, Li-Hsin Rd. 6, Hsinchu Science Park, Hsinchu 30078, Taiwan.

4. Defendant TSMC North America is a California corporation with its principal place of business at 2851 Junction Avenue, San Jose, California 95134. TSMC North America is a wholly-owned subsidiary of Taiwan Semiconductor Manufacturing Company Ltd.

5. Defendant TSMC Technology, Inc. is a Delaware corporation with its principal place of business at 2851 Junction Avenue, San Jose, California 95134. TSMC Technology, Inc. is a wholly owned subsidiary of Taiwan Semiconductor Manufacturing Company Ltd. TSMC Technology, Inc.'s registered agent, Corporation Service Company, is located at 251 Little Falls Drive, Wilmington, Delaware 19808.

6. Defendants Taiwan Semiconductor Manufacturing Company Ltd., TSMC North America, and TSMC Technology, Inc. are related entities that work in concert to design, manufacture, import, distribute, market, and/or sell the infringing devices.

7. Defendant MediaTek Inc. is a company organized under the laws of Taiwan with its principal place of business at No. 1, Dusing 1st Road, Hsinchu Science Park, Hsinchu 20078, Taiwan.

8. Defendant MediaTek USA Inc. is a Delaware corporation with its principal place of business at 2840 Junction Avenue, San Jose, California 95134.

9. Defendant MStar Semiconductor, Inc. is a company organized under the laws of Taiwan with its principal place of business at 4F-1, No. 26, Tai-yuan Street, Zhubei City, Hsinchu County 302, Taiwan.

10. Defendants MediaTek Inc., MediaTek USA Inc., and MStar Semiconductor, Inc. are related entities that work in concert to design, manufacture, import, distribute, and/or sell the infringing devices.

11. Defendant Hisense Co., Ltd. is a company organized under the laws of Hong Kong with its principal place of business at Room 3101-05 Singga Commercial Centre, 148 Connaught Road West, Sheung Wan, Hong Kong.

12. Defendant Hisense Electric Co., Ltd. (aka Qingdao Hisense Electronics Co., Ltd.) is a company organized under the laws of China with its principal place of business at Hisense Tower, No. 17 Donghaixi Road, Qingdao 266071, China. Hisense Electric Co., Ltd. is a subsidiary of Hisense Co., Ltd.

13. Defendant Hisense International Co., Ltd. is a company organized under the laws of China with its principal place of business at Hisense Tower, No. 17 Donghaixi Road, Qingdao 266071, China. Hisense International Co., Ltd. is a subsidiary of Hisense Co., Ltd.

14. Defendant Hisense Group Co., Ltd. is a company organized under the laws of China with its principal place of business at Hisense Tower, No. 17 Donghaixi Road, Qingdao 266071, China. Hisense Group Co., Ltd. is a subsidiary of Hisense International Co., Ltd.

15. Defendant Qingdao Hisense Communication Co., Ltd. is a company organized under the laws of China with its principal place of business at No. 18 Tuanjie Road, Huandao Information Industry Park, Qingdao, Shandong, China. Qingdao Hisense Communication Co., Ltd. is a subsidiary of Hisense Group, Co.

16. Defendant Hisense Import & Export Co. Ltd. is a company organized under the laws of China with its principal place of business at Hisense Tower, No. 17 Donghaixi Road, Qingdao 266071, China.

17. Defendants Hisense Co., Ltd., Hisense Electric Co., Ltd., Hisense International Co., Ltd., Hisense Group Co., Ltd., Qingdao Hisense Communication Co., Ltd., and Hisense Import & Export Co. Ltd. are related entities that work in concert, along with other related entities, to design, manufacture, import, distribute, and/or sell the infringing devices.

JURISDICTION AND VENUE

18. The Court has subject matter jurisdiction over these claims under 28 U.S.C. §§ 1331 and 1338(a) and the patent laws of the United States, 35 U.S.C. § 1 *et seq.*

19. The Court has personal jurisdiction over each of the TSMC Defendants consistent with the requirements of the Due Process Clause of the United States Constitution and the Texas Long Arm Statute. On information and belief, each TSMC Defendant has regularly and systematically transacted business in Texas, directly or through subsidiaries or intermediaries, and/or committed acts of patent infringement in Texas as alleged more particularly below. Taiwan Semiconductor Manufacturing Company Ltd., TSMC North America, and TSMC Technology,

Inc. have also placed integrated circuits using TSMC's 28 nanometer and smaller technology[1] and products containing these integrated circuits (the "Accused Products") into the stream of commerce by shipping Accused Products into Texas, shipping Accused Products knowing that those products would be shipped into Texas, and/or shipping Accused Products knowing that these Accused Products would be incorporated into other Accused Products that would be shipped into Texas. For example, through TSMC's multi-project wafer ("MPW") services, TSMC provides customized Accused Products to customers for testing, including customers in Texas. On information and belief, TSMC ships test wafers directly to the customers of its CyberShuttle MPW service and/or has knowledge of the final shipping address for customers of both its CyberShuttle MPW service and the MPW service TSMC offers in connection with Metal Oxide Semiconductor Implementation Service ("MOSIS"). The TSMC Defendants interact with customers in Texas, including through visits to customer sites in Texas. Through these interactions and visits, the TSMC Defendants directly infringe the Asserted Patents as set out in more particularity in ¶¶ 58, 77, 100, 118, 137, and 156 of this Complaint. The TSMC Defendants also interact with customers who sell the Accused Products into Texas, knowing that these customers will sell the Accused Products into Texas, either directly or through intermediaries.

[1] TSMC 28 nanometer and smaller technology includes TSMC's 28 nanometer technology (including TSMC's High-k Metal Gate gate-last technology and high-performance compact technology) ("28 Nanometer"), TSMC's 22 nanometer technology (including TSMC's 22 nanometer ultra-low power, 22 nanometer ultra-low leakage, and 22 nanometer ultra-low leakage static random access memory technologies) ("22 Nanometer"), TSMC's 20 nanometer technology ("20 Nanometer"), TSMC's 16/12 nanometer technology (including TSMC's 16 nanometer Fin Field Effect Transistor ("FinFET") process, 16 nanometer FinFET Plus process, 16 nanometer FinFET Compact Technology, and 12 nanometer FinFET Compact Technology) ("16 Nanometer"), TSMC's 10 nanometer technology (including TSMC's 10 nanometer FinFET process) ("10 Nanometer"), TSMC's 7 nanometer technology (including TSMC's 7 nanometer FinFET process) ("7 Nanometer"). Globalfoundries reserves the right to accuse any forthcoming TSMC technology, such as TSMC's 7 nanometer extreme ultraviolet lithography technology and TSMC's 5 nanometer technology.

20. TSMC Technology, Inc. has an office in Austin, Texas that, on information and belief, engages in engineering, research, and development activities relating to the Accused Products. These activities directly infringe the Asserted Patents as set out in more particularity in ¶¶ 58, 77, 100, 118, 137, and 156 of this Complaint. Taiwan Semiconductor Manufacturing Company Ltd. operates TSMC Technology, Inc.'s website and other online activities, including job postings for its Austin office. TSMC North America similarly has an office in Austin, Texas that engages in sales activities related to the Accused Products, including sales visits to customers in and around Austin. These activities directly infringe the Asserted Patents as set out in more particularity in ¶¶ 58, 77, 100, 118, 137, and 156 of this Complaint. Taiwan Semiconductor Manufacturing Company Ltd. operates TSMC North America's website and other online activities, including job postings for its Austin office. Taiwan Semiconductor Manufacturing Company Ltd. also operates an annual Technology Symposium in the United States, including workshops in Austin. Both TSMC Technology, Inc. and TSMC North America are regular attendees and/or exhibitors at these workshops. The TSMC Defendants' activities at these workshops in Austin directly infringe the Asserted Patents as set out in more particularity in ¶¶ 58, 77, 100, 118, 137, and 156 of this Complaint. The Court therefore has both general and specific personal jurisdiction over the TSMC Defendants.

21. The Court has personal jurisdiction over each of the MediaTek Defendants consistent with the requirements of the Due Process Clause of the United States Constitution and the Texas Long Arm Statute. On information and belief, each MediaTek Defendant has regularly and systematically transacted business in Texas, directly or through subsidiaries or intermediaries, and/or committed acts of patent infringement in Texas as alleged more particularly below. MediaTek Inc., MediaTek USA Inc., and MStar Semiconductor, Inc. have placed Accused

Products into the stream of commerce by shipping Accused Products into Texas, shipping Accused Products knowing that those products would be shipped into Texas, and/or shipping Accused Products knowing that these Accused Products would be incorporated into other Accused Products that would be shipped into Texas. MediaTek Inc. operates the website for MediaTek entities, including job postings for the Austin office of MediaTek USA Inc. MediaTek USA Inc. has an office in Austin, Texas, that, on information and belief, engages in design, engineering, research, development, and sales activities relating to the Accused Products. These activities directly infringe the Asserted Patents as set out in more particularity in ¶¶ 69, 92, 109, 129, 148, and 169 of this Complaint.

22. Alternatively, the Court has personal jurisdiction over MediaTek Inc. under Federal Rule of Civil Procedure 4(k)(2). This cause of action arises under federal law, MediaTek Inc. is not subject to general jurisdiction in any one state, and the exercise of jurisdiction is consistent with the United States Constitution.

23. Alternatively, the Court has personal jurisdiction over MStar Semiconductor, Inc. under Federal Rule of Civil Procedure 4(k)(2). This cause of action arises under federal law, MStar Semiconductor, Inc. is not subject to general jurisdiction in any one state, and the exercise of jurisdiction is consistent with the United States Constitution. The Court therefore has both general and specific personal jurisdiction over the MediaTek Defendants.

24. The Court has personal jurisdiction over each of the Hisense Defendants consistent with the requirements of the Due Process Clause of the United States Constitution and the Texas Long Arm Statute. On information and belief, each Hisense Defendant has regularly and systematically transacted business in Texas, directly or through affiliates, subsidiaries, or intermediaries, and/or committed acts of patent infringement in Texas as alleged more particularly

below. Hisense Co., Ltd., Hisense Electric Co., Ltd., Hisense International Co., Ltd., Hisense Group Co., Ltd., Qingdao Hisense Communication Co., Ltd., Hisense Import & Export Co. Ltd. and/or their affiliates, subsidiaries, or intermediaries have also placed Accused Products into the stream of commerce by shipping Accused Products into Texas and/or shipping Accused Products knowing that those products would be shipped into Texas. For example, Qingdao Hisense Communication Co., Ltd. manufactures smartphones, including the Hisense Infinity F24, containing Accused Products. As another example, Hisense USA Corp. is registered to do business in Texas.

25. Alternatively, the Court has personal jurisdiction over Hisense Co., Ltd. under Federal Rule of Civil Procedure 4(k)(2). This cause of action arises under federal law, Hisense Co., Ltd. is not subject to general jurisdiction in any one state, and the exercise of jurisdiction is consistent with the United States Constitution.

26. Alternatively, the Court has personal jurisdiction over Hisense International, Co., Ltd. under Federal Rule of Civil Procedure 4(k)(2). This cause of action arises under federal law, Hisense International Co., Ltd. is not subject to general jurisdiction in any one state, and the exercise of jurisdiction is consistent with the United States Constitution.

27. Alternatively, the Court has personal jurisdiction over Hisense Group Co., Ltd. under Federal Rule of Civil Procedure 4(k)(2). This cause of action arises under federal law, Hisense Group Co., Ltd. is not subject to general jurisdiction in any one state, and the exercise of jurisdiction is consistent with the United States Constitution.

28. Alternatively, the Court has personal jurisdiction over Qingdao Hisense Communication Co., Ltd. under Federal Rule of Civil Procedure 4(k)(2). This cause of action arises under federal law, Qingdao Hisense Communication Co., Ltd. is not subject to general

jurisdiction in any one state, and the exercise of jurisdiction is consistent with the United States Constitution. The Court therefore has both general and specific personal jurisdiction over the Hisense Defendants.

29. With respect to Defendant Taiwan Semiconductor Manufacturing Company Ltd., a Taiwanese company, venue is proper because suits against foreign entities are proper in any judicial district where they are subject to personal jurisdiction.

30. With respect to Defendant TSMC North America, venue is proper in this district under 28 U.S.C. § 1400(b) because Defendant TSMC North America has a regular and established place of business in this district and has committed acts of infringement in this district. Defendant TSMC North America has a permanent office location at Stone Creek II, N. Mopac Expressway, Austin, Texas 78759, which is located in Travis County and within this district. Defendant TSMC North America also employs full-time personnel such as sales personnel and engineers in this district, including in Austin, Texas. Defendant TSMC North America has also committed acts of infringement in this district by commercializing, marketing, selling, distributing, testing, and servicing certain Accused Products.

31. With respect to Defendant TSMC Technology, Inc., venue is proper in this district under 28 U.S.C. § 1400(b) because Defendant TSMC Technology, Inc. has a regular and established place of business in this district and has committed acts of infringement in this district. Defendant TSMC Technology, Inc. has a permanent office location at 11921 N. Mopac Expressway, Austin, Texas 78759, which is located in Travis County and within this district. Defendant TSMC Technology, Inc. also employs full-time personnel such as engineers in this district, including in Austin, Texas. Defendant TSMC Technology, Inc. has also committed acts of infringement in this district by commercializing, distributing, testing, and servicing certain

TSMC-branded devices, including but not limited to integrated circuits using TSMC 28 nanometer and smaller technology and products containing these integrated circuits, which are devices Globalfoundries accuses of infringement in this action.

32. With respect to Defendant MediaTek Inc., a Taiwanese company, venue is proper because suits against foreign entities are proper in any judicial district where they are subject to personal jurisdiction.

33. With respect to Defendant MediaTek USA Inc., venue is proper under 28 U.S.C. § 1400(b) because Defendant MediaTek USA Inc. has a regular and established place of business in this district and has committed acts of infringement in this district. Defendant MediaTek USA Inc. has its principal place of business at 5914 West Courtyard Drive, Austin, Texas 78730, which is located in Travis County and within this district. Defendant MediaTek USA Inc. also employs full-time personnel such as engineers in this district, including in Austin, Texas. Defendant MediaTek USA Inc. has also committed acts of infringement in this district by developing, commercializing, marketing, selling, distributing, testing, and servicing certain Accused Products.

34. With respect to Defendant MStar Semiconductor, Inc., a Taiwanese company, venue is proper because suits against foreign entities are proper in any judicial district where they are subject to personal jurisdiction.

35. With respect to Defendant Hisense Co., Ltd., a company organized under the laws of Hong Kong, venue is proper because suits against foreign entities are proper in any judicial district where they are subject to personal jurisdiction.

36. With respect to Defendant Hisense Electric Co., Ltd., a Chinese company, venue is proper because suits against foreign entities are proper in any judicial district where they are subject to personal jurisdiction.

37. With respect to Defendant Hisense International Co., Ltd., a Chinese company, venue is proper because suits against foreign entities are proper in any judicial district where they are subject to personal jurisdiction .

38. With respect to Defendant Hisense Group Co., Ltd., a Chinese company, venue is proper because suits against foreign entities are proper in any judicial district where they are subject to personal jurisdiction.

39. With respect to Defendant Qingdao Hisense Communication Co., Ltd., a Chinese company, venue is proper because suits against foreign entities are proper in any judicial district where they are subject to personal jurisdiction.

40. With respect to Defendant Hisense Import & Export Co. Ltd., a Chinese company, venue is proper because suits against foreign entities are proper in any judicial district where they are subject to personal jurisdiction.

JOINDER

41. Joinder of Defendants is proper under 35 U.S.C. § 299. The allegations of patent infringement contained herein arise out of the same series of transactions or occurrences relating to the importing into the United States and/or making, using, selling, or offering for sale within the United States, the same Accused Products, including MediaTek's system on a chip devices ("SoCs") fabricated using, for example, TSMC's 28 Nanometer or 16 Nanometer processes.

42. Common questions of fact relating to Defendants' infringement will arise in this action. For example, common questions of fact concerning TSMC's, MediaTek's, and Hisense's infringement of the '348, '910, '497, '633, '167, and '966 patents will arise in this action. Additionally, common questions of fact as to the profits and revenues derived by TSMC, MediaTek, and Hisense will arise, as well as common questions of fact related to Globalfoundries'

damages for the same. On information and belief, common questions of fact will also exist with regard to TSMC's, MediaTek's, and Hisense's defenses in this litigation, if any.

FACTUAL BACKGROUND

43. Globalfoundries is a U.S. company with manufacturing facilities that use and develop some of the world's most advanced semiconductor devices available today. Building on IBM's world-class semiconductor technology heritage, Globalfoundries, the acquirer of IBM's semiconductor division, has been accredited as a Category 1A Microelectronics Trusted Source for fabrication, design, and testing of microelectronics by the U.S. Department of Defense (DOD).[2] Globalfoundries' East Fishkill, New York facility is currently the most advanced Trusted Foundry, and as such is the only facility of its kind that can provide certain advanced circuits to satisfy the DOD's requirements. As the second-largest foundry in the world and the only advanced Trusted Foundry, Globalfoundries is uniquely equipped to efficiently and quickly meet the DOD's advanced and highly classified manufacturing and production needs—and is also equipped to do the same for its private-sector clients.

44. Globalfoundries is the most advanced pure-play foundry in the U.S. and Europe, and employs thousands of people in the U.S. and worldwide. While other companies were abandoning semiconductor manufacturing in the U.S., Globalfoundries bucked this trend by investing billions of dollars on advanced technology and research in the United States. Globalfoundries originated from another leading U.S. semiconductor company, Advanced Micro Devices' semiconductor manufacturing arm in 2009 and expanded globally through acquisition and organic investment. Its largest expenditure by far is its $15 billion organic U.S. investment in

[2] "Aerospace and Defense," https://www.globalfoundries.com/market-solutions/aerospace-and-defense.

its leading-edge, 300 acre facility known as Fab 8 in Malta, New York. Globalfoundries broke ground for that state of the art facility in 2009 and produces leading edge technology from that location to customers worldwide. A major U.S. acquisition took place in 2015 when Globalfoundries acquired IBM's microelectronics facilities and personnel in Burlington, Vermont and East Fishkill, New York—facilities that became Fab 9 and Fab 10, respectively. Globalfoundries acquired not just IBM's facilities and personnel, but also the fruits of IBM's decades of industry-leading investment in U.S. semiconductor fabrication capacity and technology. Specifically, Globalfoundries obtained 16,000 IBM patents and applications (including the '497 and '966 patents asserted in this action); numerous world-class technologists; decades of experience and expertise in semiconductor development, device expertise, design, and manufacturing; and an expanded manufacturing footprint. The acquisition cemented Globalfoundries' role as a global leader in world-class semiconductor manufacturing and advanced process technologies.[3]

45. Globalfoundries' U.S. manufacturing facilities in Burlington, Vermont; East Fishkill, New York; and Malta, New York use and develop some of the most advanced process nodes and differentiated technologies (inclusive of its 12/14nm FinFET, RF and Silicon Photonics technology solutions) available today. Fab 8 is a leading fabrication facility for advanced manufacturing in the U.S., with 40,875 square meters of cleanroom space and continued expansion, and over 3,000 total employees as of June 2019. The current capital investment for the Fab 8 campus stands at more than $15 billion, making Fab 8 the largest public-private sector industrial investment in New York State's history. The significance of this investment and its

[3] "Globalfoundries Completes Acquisition of IBM Microelectronics Business," https://www.globalfoundries.com/news-events/press-releases/globalfoundries-completes-acquisition-of-ibm-microelectronics-business.

importance to advanced manufacturing in the U.S. have been recognized by top government officials, including by the President of the U.S. during a 2012 visit to New York hosted in part by Globalfoundries.[4]

46. Globalfoundries' investment from the Champlain Valley through the Hudson Valley makes it the spine of the Northeast's Tech Valley. Three out of Globalfoundries' five fabs are in the U.S., but investment does not stop at its manufacturing capacity. Globalfoundries' manufacturing footprint is supported by facilities for research, development, sales, and design enablement located near hubs of semiconductor activity, including in Santa Clara, California; Dallas, Texas; Austin, Texas; Rochester, Minnesota; Endicott, New York; and Raleigh, North Carolina. Of its 16,000 employees worldwide, approximately 7,200 are employed in the U.S.

47. The TSMC Defendants, however, have taken a different approach and have decided to simply use Globalfoundries' patented inventions without payment or permission. TSMC is a competing semiconductor foundry with manufacturing facilities located primarily in Hsinchu, Taiwan. TSMC has recently expressed an interest in building a new manufacturing facility in the U.S., but has not reported any tangible steps towards implementing its ostensible interest. In contrast, TSMC completed building the most advanced manufacturing facility of its kind in mainland China last year. By bringing advanced 16nm FinFet to China, TSMC has positioned itself to benefit further from the shift in global supply chains out of the U.S. and Europe into Greater China. TSMC develops, manufactures, imports, and sells for importation into the U.S. semiconductor devices, including to the other Defendants. But TSMC does these things on the back of Globalfoundries, using Globalfoundries' patented technologies to make its products.

[4] "Globalfoundries Welcomes President Barack Obama to NY's Capital Region," https://blog.globalfoundries.com/globalfoundries-welcomes-president-barack-obama-to-nys-capital-region/.

Indeed, although its infringing chips have flooded the U.S. market, it appears that TSMC has attempted to avoid being subject to patent infringement allegations in the U.S. through creative legal and tax structuring. As set forth below, the Accused Products incorporate, without any license from Globalfoundries, many technologies developed by Globalfoundries and protected by patents owned by Globalfoundries. TSMC's, and/or its customers', importation of infringing articles into the U.S. from Greater China and elsewhere abroad directly harms Globalfoundries and its billions in U.S. investments in manufacturing. Globalfoundries respectfully seeks relief from this Court for Defendants' infringement.

THE ASSERTED PATENTS

48. The '348 patent is entitled "Semiconductor device with transistor local interconnects," and issued on November 12, 2013, to inventors Mahbub Rashed, Steven Soss, Jongwook Kye, Irene Y. Lin, James Benjamin Gullette, Chinh Nguyen, Jeff Kim, Marc Tarabbia, Yuansheng Ma, Yunfei Deng, Rod Augur, Seung-Hyun Rhee, Scott Johnson, Subramani Kengeri, and Suresh Venkatesan. Globalfoundries owns the entire right, title, and interest in and to the '348 patent. A copy of the '348 patent is attached to this Complaint as Exhibit A.

49. The '910 patent is entitled "Semiconductor device with transistor local interconnects," and issued on May 31, 2016 to inventors Mahbub Rashed, Irene Y. Lin, Steven Soss, Jeff Kim, Chinh Nguyen, Marc Tarabbia, Scott Johnson, Subramani Kengeri, and Suresh Venkatesan. Globalfoundries owns the entire right, title, and interest in and to the '910 patent. A copy of the '910 patent is attached to this Complaint as Exhibit B.

50. The '497 patent is entitled "Introduction of metal impurity to change workfunction of conductive electrodes," and issued on September 16, 2008 to inventors Michael P. Chudzik, Bruce B. Doris, Supratik Guha, Rajarao Jammy, Vijay Narayanan, Vamsi K. Paruchuri, Yun Y.

Wang, and Keith Kwong Hon Wong. Globalfoundries owns the entire right, title, and interest in and to the '497 patent. A copy of the '497 patent is attached to this Complaint as Exhibit C.

51. The '633 patent is entitled "Semiconductor device having contact layer providing electrical connections," and issued on December 3, 2013 to inventors Marc Tarabbia, James B. Gullette, Mahbub Rashed, David S. Doman, Irene Y. Lin, Ingolf Lorenz, Larry Ho, Chinh Nguyen, Jeff Kim, Jongwook Kye, Yuansheng Ma, Yunfel Deng, Rod Augur, Seung-Hyun Rhee, Jason E. Stephens, Scott Johnson, Subramani Kengeri, and Suresh Venkatesan. Globalfoundries owns the entire right, title, and interest in and to the '633 patent. A copy of the '633 patent is attached to this Complaint as Exhibit D.

52. The '167 patent is entitled "Method of forming a metal or metal nitride interface layer between silicon nitride and copper," and issued on February 11, 2003 to inventors Lu You, Matthew S. Buynoski, Paul R. Besser, Jeremias D. Romero, Pin-Chin Connie Wang, and Minh Q. Tran. Globalfoundries owns the entire right, title, and interest in and to the '167 patent. A copy of the '167 patent is attached to this Complaint as Exhibit E.

53. The '966 patent is entitled "Structures of and methods and tools for forming in-situ metallic/dielectric caps for interconnects," and issued on October 18, 2011 to inventors Chih-Chao Yang and Chao-Kun Hu. Globalfoundries owns the entire right, title, and interest in and to the '966 patent. A copy of the '966 patent is attached to this Complaint as Exhibit F.

CLAIMS FOR PATENT INFRINGEMENT

54. The allegations provided below are exemplary and without prejudice to Globalfoundries' infringement contentions. In providing these allegations, Globalfoundries does not convey or imply any particular claim constructions or the precise scope of the claims.

Globalfoundries' claim construction contentions regarding the meaning and scope of the claim terms will be provided under the Court's scheduling order.

55. As detailed below, each element of at least one claim of each of the Asserted Patents is literally present in the Accused Products, or is literally practiced by the process through which each of the Accused Products is made. To the extent that any element is not literally present or practiced, each such element is present or practiced under the doctrine of equivalents.

COUNT I
INFRINGEMENT OF THE '348 PATENT

56. Globalfoundries incorporates by reference the allegations set forth in paragraphs 1 through 55 as though fully set forth herein.

57. On information and belief, TSMC has infringed and continues to infringe and/or has induced infringement of one or more claims of the '348 patent, including at least claim 1, literally or under the doctrine of equivalents, by importing into the United States, and/or using, and/or selling, and/or offering for sale in the United States, without authority or license, integrated circuits manufactured by TSMC using, for example, TSMC's 16 Nanometer technology and products containing these integrated circuits (collectively, the "'348 Accused Products"), in violation of 35 U.S.C. § 271.

58. On information and belief, TSMC has directly infringed and continues to infringe one or more claims of the '348 patent, including at least claim 1, literally or under the doctrine of equivalents, by importing into the United States, and/or using, and/or selling, and/or offering to sell in the United States, without authority or license, '348 Accused Products, in violation of 35 U.S.C. § 271(a). On information and belief, TSMC uses the '348 Accused Products through at least testing, evaluations, and demonstrations. For example, as part of its sales and customer-service activities, TSMC performs infringing demonstrations, evaluations, and testing of the '348

Accused Products at customer sites in the United States, at TSMC's sites in the United States, and at TSMC's annual Technology Symposium and related workshops. On information and belief, TSMC imports the '348 Accused Products for the aforementioned uses. On information and belief, TSMC also imports the '348 Accused Products through its CyberShuttle and MOSIS MPW services. For example, TSMC imports the '348 Accused Products for distribution to CyberShuttle customers located in the United States and imports the '348 Accused Products to MOSIS in Marina Del Ray, California. On information and belief, TSMC sells the '348 Accused Products. For example, TSMC sells '348 Accused Products to customers in the United States through its CyberShuttle MPW service. On information and belief, TSMC offers the '348 Accused Products for sale. For example, TSMC engages in sales, marketing, and contracting activity in the United States and/or with United States offices of its customers.

59. The '348 Accused Products meet all the limitations of at least claim 1 of the '348 patent. Specifically, claim 1 of the '348 patent claims a semiconductor device comprising: a semiconductor substrate; a first transistor and a second transistor formed on said semiconductor substrate; each of said transistors comprising a source, a drain, and a gate; a CA layer electrically connected to at least one of said source or said drain of said first transistor; and a CB layer electrically connected to both of said gates of said transistors and said CA layer.

60. The '348 Accused Products are semiconductor devices. Each is an integrated circuit fabricated using, for example, TSMC's 16 Nanometer semiconductor process.

61. The '348 Accused Products have a semiconductor substrate. Each is an integrated circuit fabricated using, for example, TSMC's 16 Nanometer semiconductor process such that the circuit's structures are fabricated on top of a semiconductor substrate.

62. The ’348 Accused Products have a first transistor and a second transistor formed on said semiconductor substrate. Each is an integrated circuit fabricated using, for example, TSMC’s 16 Nanometer semiconductor process such that at least two transistors are formed on the semiconductor substrate.

63. In the ’348 Accused Products, each of the said transistors comprise a source, a drain, and a gate. Each is an integrated circuit fabricated using, for example, TSMC’s 16 Nanometer semiconductor process such that at least two transistors are formed on the semiconductor substrate, where each transistor has a source, a drain, and a gate.

64. The ’348 Accused Products have a CA layer electrically connected to at least one of said source or said drain of said first transistor. Each includes, for example, SRAM cells made up of multiple transistors. The SRAM cells are fabricated with a local interconnect layer that electrically connects to either the source or drain of a first transistor.

65. The ’348 Accused Products have a CB layer electrically connected to both of said gates of said transistors and said CA layer. Each includes, for example, SRAM cells made up of multiple transistors. The SRAM cells are fabricated with a local interconnect layer that electrically connects the gate of the first transistor, the gate of the second transistor, and another local interconnect layer.

66. On information and belief, TSMC actively, knowingly, and intentionally induces infringement of one or more claims of the ’348 patent under 35 U.S.C. § 271(b) by actively encouraging others to import into the United States, and/or make, use, sell, and/or offer to sell in the United States, ’348 Accused Products or products containing the infringing semiconductor components of the ’348 Accused Products. For example, TSMC representatives travel to customer sites in the United States for sales and support activity that includes working with customers to

facilitate these customers' infringing testing, marketing, importation, and sales activity. On information and belief, TSMC supplies customers with '348 Accused Products. Certain TSMC semiconductor components are compatible with standards specific to the United States such as Code Division Multiple Access ("CDMA") wireless standards, required primarily for compatibility with major carriers in the United States. Additionally, the majority of TSMC's net revenue in 2018 was generated from contracts with customers in the United States. TSMC Annual Report 2018 (I) at 61. On information and belief, TSMC maintains internal projections and analyses of potential markets for specific end-user products, including for certain of the '348 Accused Products. TSMC additionally hosts an Open Innovation Platform Forum in the United States with the goal of facilitating partnerships and collaborations, in addition to an annual symposium and workshops across the United States. *Case Study: Open Innovation Platform*, Taiwan Semiconductor Manufacturing Company Ltd. Website, https://www.tsmc.com/csr/en/update/innovationAndService/caseStudy/1/index.html (last visited July 17, 2019); *Events*, Taiwan Semiconductor Manufacturing Company Ltd. Website, https://www.tsmc.com/english/newsEvents/events.htm (last visited July 17, 2019). TSMC leverages these events to publicize technological advances and design updates to potential customers and partners in the United States and provide training opportunities to facilitate familiarity with TSMC products, including '348 Accused Products.

67. By at least August 26, 2019, Globalfoundries disclosed, by sending a letter and filing this Complaint and other Complaints involving the Asserted Patents, the existence of the '348 patent and identified at least some of TSMC's and others' activities that infringe the '348 patent. Thus, based on this disclosure, TSMC had knowledge of the '348 patent and that its activities infringe the '348 patent since at least August 26, 2019. Based on Globalfoundries'

disclosures, TSMC has also known or should have known since at least August 26, 2019 that its customers, distributors, and other purchasers of the '348 Accused Products are infringing the '348 patent at least because TSMC has known that it is infringing the '348 patent.

68. On information and belief, since the filing of this Complaint, TSMC has continued to use, sell, and/or offer for sale the '348 Accused Products in the United States, and/or import the '348 Accused Products into the United States despite its knowledge of the '348 patent and its infringement of that patent, and has continued to induce infringement of the '348 patent. TSMC's on-going infringement is willful.

69. Other entities directly infringe the '348 patent by making, using, offering to sell, and/or selling at least some '348 Accused Products in the United States and by importing '348 Accused Products into the United States. For example, TSMC's customer MediaTek has infringed and continues to infringe one or more claims of the '348 patent, including at least claim 1, literally or under the doctrine of equivalents, at least under 35 U.S.C. § 271(a) by importing into the United States, and/or using, and/or selling, and/or offering for sale in the United States, without authority or license, semiconductor devices fabricated using, for example, TSMC's 16 Nanometer process, such as MediaTek's Helio P22 SoCs (the "MediaTek '348 Accused Products"). On information and belief, MediaTek imports the MediaTek '348 Accused Products into the United States for sales and distribution to customers located in the United States, including sales and distribution through MediaTek USA Inc. On information and belief, MediaTek sells MediaTek '348 Accused Products in the United States. For example, MediaTek hires permanent sales personnel located throughout the United States. In particular, MediaTek has at least seven offices throughout the United States. On information and belief, each of these offices engages in sales activities. On information and belief, these sales activities include direct sales by MediaTek to original equipment manufacturers,

including original equipment manufacturers based in the United States. On information and belief, MediaTek offers the MediaTek '348 Accused Products for sale in the United States. For example, MediaTek engages in sales, marketing, and contracting activity in the United States and/or with United States offices of its customers.

70. On information and belief, MediaTek actively, knowingly, and intentionally induces infringement of one or more claims of the '348 patent under 35 U.S.C. § 271(b) by actively encouraging others to import into the United States, and/or make, use, sell, and/or offer to sell in the United States, MediaTek '348 Accused Products or products containing the infringing semiconductor components of the MediaTek '348 Accused Products. For example, MediaTek actively promotes the sale, use, and importation of the MediaTek '348 Accused Products in marketing materials, technical specifications, data sheets, white papers, product briefs, demonstrative videos, web pages on its website (www.mediatek.com), press releases, development platforms, online forums, and through its sales and distribution channels that encourage infringing uses, sales, offers to sell, and importation of the MediaTek '348 Accused Products. On information and belief, MediaTek supplies customers with MediaTek '348 Accused Products so that they may be used, sold, or offered for sale by those customers. MediaTek also seeks and obtains certifications from United States governmental organizations for MediaTek '348 Accused Products. For example, MediaTek's Helio P60 has been granted Federal Information Processing Standard ("FIPS") certification by the National Institute of Standards and Technology of the United States of America. As another example, certain MediaTek '348 Accused Products are compatible with standards specific to the United States such as Code Division Multiple Access ("CDMA") wireless standards, required primarily for compatibility with major carriers in the United States.

71. By at least August 26, 2019, Globalfoundries disclosed, by sending a letter and filing this Complaint, the existence of the '348 patent and identified at least some of MediaTek's and others' activities that infringe the '348 patent. Thus, based on this disclosure, MediaTek had knowledge of the '348 patent and that its activities infringe the '348 patent since at least August 26, 2019. Based on Globalfoundries' disclosures, MediaTek has also known or should have known since at least August 26, 2019 that its customers, distributors, and other purchasers of the MediaTek '348 Accused Products are infringing the '348 patent at least because MediaTek has known that it is infringing the '348 patent.

72. MediaTek's customers, for example BLU Products, Inc., have also infringed and continue to infringe one or more claims of the '348 patent, including at least claim 1, literally or under the doctrine of equivalents at least under 35 U.S.C. § 271(a) by importing into the United States and/or making, using, selling, and/or offering for sale in the United States, without any authority or license, smartphones, for example the VIVO XL4, that include MediaTek '348 Accused Products. These products are offered for sale at various retail locations throughout the United States.

73. Globalfoundries has suffered and continues to suffer damages as a result of Defendants' infringement of the '348 patent.

74. Defendants' continuing acts of infringement are a basis of consumer demand for the '348 Accused Products. Defendants' continuing acts of infringement are therefore irreparably harming and causing damage to Globalfoundries, for which Globalfoundries has no adequate remedy at law, and will continue to suffer such irreparable injury unless Defendants' continuing acts of infringement are enjoined by the Court. The hardships that an injunction would impose are

less than those faced by Globalfoundries should an injunction not issue. The public interest would be served by issuance of an injunction.

COUNT II
INFRINGEMENT OF THE '910 PATENT

75. Globalfoundries incorporates by reference the allegations set forth in paragraphs 1 through 74 as though fully set forth herein.

76. On information and belief, TSMC has infringed and continues to infringe and/or has induced infringement of one or more claims of the '910 patent, including at least claim 1, literally or under the doctrine of equivalents, by importing into the United States, and/or using, and/or selling, and/or offering for sale in the United States, without authority or license, integrated circuits manufactured by TSMC using, for example, TSMC's 16 Nanometer technology and products containing these integrated circuits (collectively, the "'910 Accused Products"), in violation of 35 U.S.C. § 271.

77. On information and belief, TSMC has directly infringed and continues to infringe one or more claims of the '910 patent, including at least claim 1, literally or under the doctrine of equivalents, by importing into the United States, and/or using, and/or selling, and/or offering to sell in the United States, without authority or license, '910 Accused Products, in violation of 35 U.S.C. § 271(a). On information and belief, TSMC uses the '910 Accused Products through at least testing, evaluations, and demonstrations. For example, as part of its sales and customer-service activities TSMC performs infringing demonstrations, evaluations, and testing of the '910 Accused Products at customer sites in the United States, at TSMC's sites in the United States, and at TSMC's annual Technology Symposium and related workshops. On information and belief, TSMC imports the '910 Accused Products for the aforementioned uses. On information and belief, TSMC also imports the '910 Accused Products through its CyberShuttle and MOSIS MPW

services. For example, TSMC imports the '910 Accused Products for distribution to CyberShuttle customers located in the United States and imports the '910 Accused Products to MOSIS in Marina Del Ray, California. On information and belief, TSMC sells the '910 Accused Products. For example, TSMC sells '910 Accused Products to customers in the United States through its CyberShuttle MPW service. On information and belief, TSMC offers the '910 Accused Products for sale. For example, TSMC engages in sales, marketing, and contracting activity in the United States and/or with United States offices of its customers.

78. The '910 Accused Products meet all the limitations of at least claim 1 of the '910 patent. Specifically, claim 1 of the '910 patent claims a semiconductor device comprising: a semiconductor substrate; a first transistor and a second transistor disposed on said substrate; each of said transistors comprising a source, a drain, and a gate; a first CB layer electrically connected to said gate of said first transistor; a second CB layer electrically connected to said gate of said second transistor; and a CA layer extending longitudinally between a first end and a second end; wherein said first CB layer is electrically connected to said first end of said CA layer; said second CB layer is electrically connected to said second end of said CA layer; said gate of said first transistor extends longitudinally along a first line and said gate of said second transistor extends longitudinally along a second line, wherein said first and second lines are generally parallel to one another and spaced apart from one another; and said CA layer extends generally parallel to said lines and generally perpendicular to said first CB layer and said second CB layer; and wherein said first CB layer extends longitudinally beyond said gate of said first transistor and/or said second CB layer extends longitudinally beyond said gate of said second transistor.

79. The '910 Accused Products are semiconductor devices. Each is an integrated circuit fabricated using, for example, TSMC's 16 Nanometer semiconductor process.

80. The ’910 Accused Products have a semiconductor substrate. Each is an integrated circuit fabricated using, for example, TSMC’s 16 Nanometer semiconductor process such that the circuit’s structures are fabricated on top of a semiconductor substrate.

81. The ’910 Accused Products have a first transistor and a second transistor disposed on said substrate. Each is an integrated circuit fabricated using, for example, TSMC’s 16 Nanometer semiconductor process such that at least two transistors are formed on the semiconductor substrate.

82. In the ’910 Accused Products, each of the said transistors comprise a source, a drain, and a gate. Each is an integrated circuit fabricated using, for example, TSMC’s 16 Nanometer semiconductor process such that at least two transistors are formed on the substrate, where each transistor has a source, a drain, and a gate.

83. The ’910 Accused Products have a first CB layer electrically connected to said gate of said first transistor. Each includes, for example, SRAM cells made up of multiple transistors. The SRAM cells are fabricated with a local interconnect layer that electrically connects to the gate of a first transistor.

84. The ’910 Accused Products have a second CB layer electrically connected to said gate of said second transistor. Each includes, for example, SRAM cells made up of multiple transistors. The SRAM cells are fabricated with another local interconnect layer that electrically connects to the gate of a second transistor.

85. The ’910 Accused Products have a CA layer extending longitudinally between a first end and a second end; wherein said first CB layer is electrically connected to said first end of said CA layer; said second CB layer is electrically connected to said second end of said CA layer. Each includes, for example, SRAM cells made up of multiple transistors. The SRAM cells are

fabricated with a layer having a first end and a second end that extends longitudinally such that its ends electrically connect the first and second local interconnect layers.

86. In the '910 Accused Products, the gate of said first transistor extends longitudinally along a first line and said gate of said second transistor extends longitudinally along a second line, wherein said first and second lines are generally parallel to one another and spaced apart from one another. Each includes, for example, SRAM cells made up of multiple transistors. The SRAM cells are fabricated such that the first and second transistors include gates that extend longitudinally along lines that are generally parallel to one another and spaced apart.

87. In the '910 Accused Products, the CA layer extends generally parallel to said lines and generally perpendicular to said first CB layer and said second CB layer. Each includes, for example, SRAM cells made up of multiple transistors. The SRAM cells are fabricated such that a local interconnect layer is parallel to the lines on which the gates of the first and second transistors lie, and the local interconnect layer is perpendicular to the first and second local interconnect layers described in ¶¶ 83 and 84.

88. In the '910 Accused Products, one or both of the CB layers extends longitudinally beyond the respective gates of the first and second transistors. Each includes, for example, SRAM cells made up of multiple transistors. The SRAM cells are fabricated such that the local interconnect layers described in ¶¶ 83 and 84 extend longitudinally beyond the gates of a first and/or second transistor.

89. On information and belief, TSMC actively, knowingly, and intentionally induces infringement of one or more claims of the '910 patent under 35 U.S.C. § 271(b) by actively encouraging others to import into the United States, and/or make, use, sell, and/or offer to sell in the United States, '910 Accused Products or products containing the infringing semiconductor

components of the '910 Accused Products. For example, TSMC representatives travel to customer sites in the United States for sales and support activity that includes working with customers to facilitate these customers' infringing testing, marketing, importation, and sales activity. On information and belief, TSMC supplies customers with '910 Accused Products. Certain TSMC semiconductor components are compatible with standards specific to the United States such as Code Division Multiple Access ("CDMA") wireless standards, required primarily for compatibility with major carriers in the United States. Additionally, the majority of TSMC's net revenue in 2018 was generated from contracts with customers in the United States. TSMC Annual Report 2018 (I) at 61. On information and belief, TSMC maintains internal projections and analyses of potential markets for specific end-user products, including for certain of the '910 Accused Products. TSMC additionally hosts an Open Innovation Platform Forum in the United States with the goal of facilitating partnerships and collaborations, in addition to an annual symposium and workshops across the United States. *Case Study: Open Innovation Platform*, Taiwan Semiconductor Manufacturing Company Ltd. Website, https://www.TSMC.com/csr/en/update/innovationAndService/caseStudy/1/index.html (last visited July 17, 2019); *Events*, Taiwan Semiconductor Manufacturing Company Ltd. Website, https://www.TSMC.com/english/newsEvents/events.htm (last visited July 17, 2019). TSMC leverages these events to publicize technological advances and design updates to potential customers and partners in the United States and provide training opportunities to facilitate familiarity with TSMC products, including '910 Accused Products.

90. By at least August 26, 2019, Globalfoundries disclosed, by sending a letter and filing this Complaint and other Complaints involving the Asserted Patents, the existence of the '910 patent and identified at least some of TSMC's and others' activities that infringe the '910

patent. Thus, based on this disclosure, TSMC had knowledge of the '910 patent and that its activities infringe the '910 patent since at least August 26, 2019. Based on Globalfoundries' disclosures, TSMC has also known or should have known since at least August 26, 2019 that its customers, distributors, and other purchasers of the '910 Accused Products are infringing the '910 patent at least because TSMC has known that it is infringing the '910 patent.

91. On information and belief, since the filing of this Complaint, TSMC has continued to use, sell, and/or offer for sale the '910 Accused Products in the United States, and/or import the '910 Accused Products into the United States despite its knowledge of the '910 patent and its infringement of that patent, and has continued to induce infringement of the '910 patent. TSMC's on-going infringement is willful.

92. Other entities directly infringe the '910 patent by making, using, offering to sell, and/or selling at least some '910 Accused Products in the United States and by importing '910 Accused Products into the United States. For example, TSMC's customer MediaTek has infringed and continues to infringe one or more claims of the '910 patent, including at least claim 1, literally or under the doctrine of equivalents, at least under 35 U.S.C. § 271(a) by importing into the United States, and/or using, and/or selling, and/or offering for sale in the United States, without authority or license, semiconductor devices fabricated using, for example, TSMC's 16 Nanometer process, such as MediaTek's Helio P22 SoCs (the "MediaTek '910 Accused Products"). On information and belief, MediaTek imports the MediaTek '910 Accused Products into the United States for sales and distribution to customers located in the United States, including sales and distribution through MediaTek USA Inc. On information and belief, MediaTek sells MediaTek '910 Accused Products in the United States. For example, MediaTek hires permanent sales personnel located throughout the United States. In particular, MediaTek has at least seven offices throughout the United States.

On information and belief, each of these offices engages in sales activities. On information and belief, these sales activities include direct sales by MediaTek to original equipment manufacturers, including original equipment manufacturers based in the United States. On information and belief, MediaTek offers the MediaTek '910 Accused Products for sale in the United States. For example, MediaTek engages in sales, marketing, and contracting activity in the United States and/or with United States offices of its customers.

93. On information and belief, MediaTek actively, knowingly, and intentionally induces infringement of one or more claims of the '910 patent under 35 U.S.C. § 271(b) by actively encouraging others to import into the United States, and/or make, use, sell, and/or offer to sell in the United States, MediaTek '910 Accused Products or products containing the infringing semiconductor components of the MediaTek '910 Accused Products. For example, MediaTek actively promotes the sale, use, and importation of the MediaTek '910 Accused Products in marketing materials, technical specifications, data sheets, white papers, product briefs, demonstrative videos, web pages on its website (www.mediatek.com), press releases, development platforms, online forums, and through its sales and distribution channels that encourage infringing uses, sales, offers to sell, and importation of the MediaTek '910 Accused Products. On information and belief, MediaTek supplies customers with MediaTek '910 Accused Products so that they may be used, sold, or offered for sale by those customers. MediaTek also seeks and obtains certifications from United States governmental organizations for MediaTek '910 Accused Products. For example, MediaTek's Helio P60 has been granted Federal Information Processing Standard ("FIPS") certification by the National Institute of Standards and Technology of the United States of America. As another example, certain MediaTek '910 Accused Products are compatible with standards specific to the United States such as Code Division Multiple Access

("CDMA") wireless standards, required primarily for compatibility with major carriers in the United States.

94. By at least August 26, 2019, Globalfoundries disclosed, by sending a letter and filing this Complaint, the existence of the '910 patent and identified at least some of MediaTek's and others' activities that infringe the '910 patent. Thus, based on this disclosure, MediaTek had knowledge of the '910 patent and that its activities infringe the '910 patent since at least August 26, 2019. Based on Globalfoundries' disclosures, MediaTek has also known or should have known since at least August 26, 2019 that its customers, distributors, and other purchasers of the MediaTek '910 Accused Products are infringing the '910 patent at least because MediaTek has known that it is infringing the '910 patent.

95. MediaTek's customers, for example BLU Products, Inc., have also infringed and continue to infringe one or more claims of the '910 patent, including at least claim 1, literally or under the doctrine of equivalents at least under 35 U.S.C. § 271(a) by importing into the United States and/or making, using, selling, and/or offering for sale in the United States, without any authority or license, smartphones, for example the VIVO XL4, that include MediaTek '910 Accused Products. These products are offered for sale at various retail locations throughout the United States.

96. Globalfoundries has suffered and continues to suffer damages as a result of Defendants' infringement of the '910 patent.

97. Defendants' continuing acts of infringement are a basis of consumer demand for the '910 Accused Products. Defendants' continuing acts of infringement are therefore irreparably harming and causing damage to Globalfoundries, for which Globalfoundries has no adequate remedy at law, and will continue to suffer such irreparable injury unless Defendants' continuing

acts of infringement are enjoined by the Court. The hardships that an injunction would impose are less than those faced by Globalfoundries should an injunction not issue. The public interest would be served by issuance of an injunction.

COUNT III
INFRINGEMENT OF THE '497 PATENT

98. Globalfoundries incorporates by reference the allegations set forth in paragraphs 1 through 97 as though fully set forth herein.

99. On information and belief, TSMC has infringed and continues to infringe and/or has induced infringement of claim 1 of the '497 patent literally or under the doctrine of equivalents, by importing into the United States, and/or using, and/or selling, and/or offering for sale in the United States, without authority or license, integrated circuits manufactured by TSMC using, for example, TSMC's 28 Nanometer or 16 Nanometer technology and products containing these integrated circuits (collectively, the "'497 Accused Products"), in violation of 35 U.S.C. § 271.

100. On information and belief, TSMC has directly infringed and continues to infringe claim 1 of the '497 patent literally or under the doctrine of equivalents, by importing into the United States, and/or using, and/or selling, and/or offering to sell in the United States, without authority or license, '497 Accused Products, in violation of 35 U.S.C. § 271(g). On information and belief, TSMC uses the '497 Accused Products through at least testing, evaluations, and demonstrations. For example, as part of its sales and customer-service activities TSMC performs infringing demonstrations, evaluations, and testing of the '497 Accused Products at customer sites in the United States, at TSMC's sites in the United States, and at TSMC's annual Technology Symposium and related workshops. On information and belief, TSMC imports the '497 Accused Products for the aforementioned uses. On information and belief, TSMC also imports the '497 Accused Products through its CyberShuttle and MOSIS MPW services. For example, TSMC

imports the '497 Accused Products for distribution to CyberShuttle customers located in the United States and imports the '497 Accused Products to MOSIS in Marina Del Ray, California. On information and belief, TSMC sells the '497 Accused Products. For example, TSMC sells '497 Accused Products to customers in the United States through its CyberShuttle MPW service. On information and belief, TSMC offers the Accused Products for sale. For example, TSMC engages in sales, marketing, and contracting activity in the United States and/or with United States offices of its customers.

101. The '497 Accused Products are manufactured by a process including all of the limitations of claim 1 of the '497 patent. Specifically, claim 1 of the '497 patent claims a method of changing workfunction of a conductive stack comprising: providing a material stack that comprises a Hf-based dielectric having a dielectric constant of greater than silicon dioxide, a metal-containing material including at least one metal selected from Ti, Zr, Hf, V, Nb and Ta located above said Hf-based dielectric, and a conductive electrode located above said metal-containing material; and introducing at least one workfunction altering metal impurity into said metal-containing material, wherein said at least one workfunction altering metal impurity is introduced during forming of a metal impurity containing layer or after formation of a layer containing said metal-containing material, and said introducing is selected from (i) codepositing the at least one workfunction altering metal impurity and the metal-containing material, (ii) forming a first layer of the metal-containing material, forming a layer containing the metal impurities on said first layer, and forming a second layer of the metal-containing material, and (iii) forming a material layer containing the metal impurities below and/or above the metal-containing material, and subjecting the material stack to a thermal process, and with the proviso that when an n-type workfunction is required, the at least one workfunction altering metal impurity comprises at least one element from

Groups IIIB, IVB, or VB of the Periodic Table of Elements, and when a p-type workfunction is required the at least one workfunction altering metal impurity comprises at least one element from VIB, VIIB or VIII of the Periodic Table of Elements.

102. The '497 Accused Products are made by a method of changing workfunction of a conductive stack. TSMC's manufacture of each of the '497 Accused Products involves changing workfunction for at least some conductive stacks in the product.

103. During the manufacture of the '497 Accused Products, a material stack is provided that comprises a Hf-based dielectric having a dielectric constant of greater than silicon dioxide, a metal-containing material including at least one metal selected from Ti, Zr, Hf, V, Nb and Ta located above said Hf-based dielectric, and a conductive electrode located above said metal-containing material. TSMC's manufacture of at least one n-type FET in each of the '497 Accused Products includes creating a material stack with an Hf-based dielectric on top of a substrate. Hf-based dielectrics are known in the art to have a dielectric constant greater than silicon dioxide. TSMC's manufacture of at least one n-type FET in each of the '497 Accused Products includes a metal-containing material that includes titanium metal above the Hf-based dielectric. TSMC's manufacture of at least one n-type FET in each of the '497 Products includes a conductive electrode located above the metal-containing material to form the gate of at least one n-type FET.

104. During the manufacture of the '497 Accused Products, at least one workfunction altering metal impurity is introduced into said metal-containing material, wherein said at least one workfunction altering metal impurity is introduced during forming of a metal impurity containing layer or after formation of a layer containing said metal-containing material, and said introducing is selected from (i) codepositing the at least one workfunction altering metal impurity and the metal-containing material, (ii) forming a first layer of the metal-containing material, forming a

layer containing the metal impurities on said first layer, and forming a second layer of the metal-containing material, and (iii) forming a material layer containing the metal impurities below and/or above the metal-containing material, and subjecting the material stack to a thermal process, and with the proviso that when an n-type workfunction is required, the at least one workfunction altering metal impurity comprises at least one element from Groups IIIB, IVB, or VB of the Periodic Table of Elements, and when a p-type workfunction is required the at least one workfunction altering metal impurity comprises at least one element from VIB, VIIB or VIII of the Periodic Table of Elements. TSMC's manufacture of at least one n-type FET in each of the '497 Accused Products includes introducing tantalum into the metal-containing material. The tantalum is introduced into the metal impurity containing layer by forming a first layer of the metal-containing material (titanium), forming a layer containing the tantalum metal impurities on the first layer, and forming a second layer of the metal-containing material (titanium). Tantalum is a Group VB metal. By this process, the workfunction of the material stack is altered.

105. On information and belief, the '497 Accused Products are neither materially changed by subsequent processes nor become trivial and nonessential components of another product.

106. On information and belief, TSMC actively, knowingly, and intentionally induces infringement of claim 1 of the '497 patent under 35 U.S.C. § 271(b) by actively encouraging others to import into the United States, and/or use, sell, and/or offer to sell in the United States, '497 Accused Products or products containing the infringing semiconductor components of the '497 Accused Products. For example, TSMC representatives travel to customer sites in the United States for sales and support activity that includes working with customers to facilitate these customers' infringing testing, marketing, importation, and sales activity. On information and

belief, TSMC supplies customers with '497 Accused Products. Certain TSMC semiconductor components are compatible with standards specific to the United States such as Code Division Multiple Access ("CDMA") wireless standards, required primarily for compatibility with major carriers in the United States. Additionally, the majority of TSMC's net revenue in 2018 was generated from contracts with customers in the United States. TSMC Annual Report 2018 (I) at 61. On information and belief, TSMC maintains internal projections and analyses of potential markets for specific end-user products, including for certain of the '497 Accused Products. TSMC additionally hosts an Open Innovation Platform Forum in the United States with the goal of facilitating partnerships and collaborations, in addition to an annual symposium and workshops across the United States. *Case Study: Open Innovation Platform*, Taiwan Semiconductor Manufacturing Company Ltd. Website, https://www.TSMC.com/csr/en/update/innovationAndService/caseStudy/1/index.html (last visited July 17, 2019); *Events*, Taiwan Semiconductor Manufacturing Company Ltd. Website, https://www.TSMC.com/english/newsEvents/events.htm (last visited July 17, 2019). TSMC leverages these events to publicize technological advances and design updates to potential customers and partners in the United States and provide training opportunities to facilitate familiarity with TSMC products, including '497 Accused Products.

107. By at least August 26, 2019, Globalfoundries disclosed, by sending a letter and filing this Complaint and other Complaints involving the Asserted Patents, the existence of the '497 patent and identified at least some of TSMC's and others' activities that infringe the '497 patent. Thus, based on this disclosure, TSMC had knowledge of the '497 patent and that its activities infringe the '497 patent since at least August 26, 2019. Based on Globalfoundries' disclosures, TSMC has also known or should have known since at least August 26, 2019 that its

customers, distributors, and other purchasers of the '497 Accused Products are infringing the '497 patent at least because TSMC has known that it is infringing the '497 patent.

108. On information and belief, since the filing of this Complaint, TSMC has continued to use, sell, and/or offer for sale the '497 Accused Products in the United States, and/or import the '497 Accused Products into the United States despite its knowledge of the '497 patent and its infringement of that patent, and has continued to induce infringement of the '497 patent. TSMC's on-going infringement is willful.

109. Other entities directly infringe the '497 patent by using, offering to sell, and/or selling at least some '497 Accused Products in the United States and by importing '497 Accused Products into the United States. For example, TSMC's customer MediaTek has infringed and continues to infringe claim 1 of the '497 patent literally or under the doctrine of equivalents at least under 35 U.S.C. § 271(g) by importing into the United States and/or using, selling, and/or offering for sale in the United States, without any authority or license, semiconductor devices fabricated using, for example, TSMC's 28 Nanometer or 16 Nanometer process, such as MediaTek's 6737, 1602, and Helio P22 SoCs, (the "MediaTek '497 Accused Products"). On information and belief, MediaTek imports MediaTek '497 Accused Products into the United States for sales and distribution to customers located in the United States, including sales and distribution through MediaTek USA Inc. On information and belief, MediaTek sells MediaTek '497 Accused Products in the United States. For example, MediaTek hires permanent sales personnel located throughout the United States. In particular, MediaTek has at least seven offices throughout the United States. On information and belief, each of these offices engages in sales activities. On information and belief, these sales activities include direct sales by MediaTek to original equipment manufacturers, including original equipment manufacturers based in the United States.

On information and belief, MediaTek offers the MediaTek '497 Accused Products for sale in the United States. For example, MediaTek engages in sales, marketing, and contracting activity in the United States and/or with United States offices of its customers.

110. On information and belief, MediaTek actively, knowingly, and intentionally induces infringement of claim 1 of the '497 patent under 35 U.S.C. § 271(b) by actively encouraging others to import into the United States, and/or use, sell, and/or offer to sell in the United States, MediaTek '497 Accused Products or products containing the infringing semiconductor components of the MediaTek '497 Accused Products. For example, MediaTek actively promotes the sale, use, and importation of the MediaTek '497 Accused Products in marketing materials, technical specifications, data sheets, white papers, product briefs, demonstrative videos, web pages on its website (www.mediatek.com), press releases, development platforms, online forums, and through its sales and distribution channels that encourage infringing uses, sales, offers to sell, and importation of the MediaTek '497 Accused Products. On information and belief, MediaTek supplies customers with MediaTek '497 Accused Products so that they may be used, sold, or offered for sale by those customers. MediaTek also seeks and obtains certifications from United States governmental organizations for MediaTek '497 Accused Products. For example, MediaTek's Helio P60 has been granted Federal Information Processing Standard ("FIPS") certification by the National Institute of Standards and Technology of the United States of America. As another example, certain MediaTek '497 Accused Products are compatible with standards specific to the United States such as Code Division Multiple Access ("CDMA") wireless standards, required primarily for compatibility with major carriers in the United States.

111. By at least August 26, 2019, Globalfoundries disclosed, by sending a letter and filing this Complaint, the existence of the '497 patent and identified at least some of MediaTek's and others' activities that infringe the '497 patent. Thus, based on this disclosure, MediaTek had knowledge of the '497 patent and that its activities infringe the '497 patent since at least August 26, 2019. Based on Globalfoundries' disclosures, MediaTek has also known or should have known since at least August 26, 2019 that its customers, distributors, and other purchasers of the MediaTek '497 Accused Products are infringing the '497 patent at least because MediaTek has known that it is infringing the '497 patent.

112. MediaTek's customers, for example, Hisense, TCL Corp. (including its affiliates), and BLU Products, Inc. have also infringed and continue to infringe claim 1 of the '497 patent literally or under the doctrine of equivalents at least under 35 U.S.C. § 271(g) by importing into the United States and/or using, selling, and/or offering for sale in the United States, without any authority or license, televisions and smartphones, for example the Hisense Infinity F24, TCL 50DC600, and BLU VIVO XL4, that include MediaTek '497 Accused Products. These products are offered for sale at various retail locations throughout the United States.

113. On information and belief, Hisense, through one or more affiliates or subsidiaries, imports, sells, and/or offers to sell at least televisions and smartphones, for example the Hisense Infinity F24, and/or actively, knowingly, and intentionally induces infringement of claim 1 of the '497 patent under 35 U.S.C. § 271(b) by actively encouraging others to import into the United States, and/or use, sell, and/or offer to sell in the United States, MediaTek '497 Accused Products or products containing the infringing semiconductor components of the MediaTek '497 Accused Products. For example, Hisense actively, knowingly, and intentionally induces distributors such as Breed Products, Inc. to import into the United States, and/or sell, and/or offer to sell in the

United States at least smartphones such as the Hisense Infinity F24, containing MediaTek '497 Accused Products.

114. Globalfoundries has suffered and continues to suffer damages as a result of Defendants' infringement of the '497 patent.

115. Defendants' continuing acts of infringement are a basis of consumer demand for the '497 Accused Products. Defendants' continuing acts of infringement are therefore irreparably harming and causing damage to Globalfoundries, for which Globalfoundries has no adequate remedy at law, and will continue to suffer such irreparable injury unless Defendants' continuing acts of infringement are enjoined by the Court. The hardships that an injunction would impose are less than those faced by Globalfoundries should an injunction not issue. The public interest would be served by issuance of an injunction.

COUNT IV
INFRINGEMENT OF THE '633 PATENT

116. Globalfoundries incorporates by reference the allegations set forth in paragraphs 1 through 115 as though fully set forth herein.

117. On information and belief, TSMC has infringed and continues to infringe and/or has induced infringement of one or more claims of the '633 patent, including at least claim 1, literally or under the doctrine of equivalents, by importing into the United States, and/or using, and/or selling, and/or offering for sale in the United States, without authority or license, integrated circuits manufactured by TSMC using, for example, TSMC's 16 Nanometer technology and products containing these integrated circuits (collectively, the "'633 Accused Products"), in violation of 35 U.S.C. § 271.

118. On information and belief, TSMC has directly infringed and continues to infringe one or more claims of the '633 patent, including at least claim 1, literally or under the doctrine of

equivalents, by importing into the United States, and/or using, and/or selling, and/or offering to sell in the United States, without authority or license, '633 Accused Products, in violation of 35 U.S.C. § 271(a). On information and belief, TSMC uses the '633 Accused Products through at least testing, evaluations, and demonstrations. For example, as part of its sales and customer-service activities TSMC performs infringing demonstrations, evaluations, and testing of the '633 Accused Products at customer sites in the United States, at TSMC's sites in the United States, and at TSMC's annual Technology Symposium and related workshops. On information and belief, TSMC imports the '633 Accused Products for the aforementioned uses. On information and belief, TSMC also imports the '633 Accused Products through its CyberShuttle and MOSIS MPW services. For example, TSMC imports the '633 Accused Products for distribution to CyberShuttle customers located in the United States and imports the '633 Accused Products to MOSIS in Marina Del Ray, California. On information and belief, TSMC sells the '633 Accused Products. For example, TSMC sells '633 Accused Products to customers in the United States through its CyberShuttle MPW service. On information and belief, TSMC offers the '633 Accused Products for sale. For example, TSMC engages in sales, marketing, and contracting activity in the United States and/or with United States offices of its customers.

119. The '633 Accused Products meet all the limitations of at least claim 1 of the '633 patent. Specifically, claim 1 of the '633 patent claims a semiconductor device comprising: a semiconductor substrate having a diffusion region; a transistor formed within said diffusion region and comprising a source, a drain, and a gate; a metal layer including a power rail disposed outside said diffusion region and a pin layer extending from said diffusion region to outside said diffusion region; a contact layer disposed above said substrate and below said metal layer; and a via disposed between said contact layer and said power rail to electrically connect said contact layer to said

power rail; and wherein said contact layer includes a first length disposed outside said diffusion region and a second length extending from said first length into said diffusion region and electrically connected to said transistor.

120. The '633 Accused Products are semiconductor devices. Each is an integrated circuit fabricated using, for example, TSMC's 16 Nanometer semiconductor process.

121. The '633 Accused Products have a semiconductor substrate having a diffusion region. Each is an integrated circuit fabricated using, for example, TSMC's 16 Nanometer semiconductor process such that the circuit's structures are fabricated on top of a semiconductor substrate. The substrate of each has a diffusion region.

122. The '633 Accused Products have a transistor formed within the diffusion region and comprising a source, a drain, and a gate. Each is an integrated circuit fabricated using, for example, TSMC's 16 Nanometer semiconductor process such that each has a transistor formed within the diffusion region of the substrate, where each transistor has a source, a drain, and a gate.

123. The '633 Accused Products have a metal layer including a power rail disposed outside said diffusion region and a pin layer extending from said diffusion region to outside said diffusion region. Each is an integrated circuit fabricated using, for example, TSMC's 16 Nanometer semiconductor process such that each has a metal layer including a power rail, where the power rail is disposed outside the diffusion region. Each has a pin layer extending from the diffusion region to outside the diffusion region. For example, in integrated circuits including a GPU, a power rail is formed outside the diffusion region at the M1 level, and a pin layer is formed extending both inside and outside the diffusion region.

124. The '633 Accused Products have a contact layer disposed above said substrate and below said metal layer; and a via disposed between said contact layer and said power rail to

electrically connect said contact layer to said power rail. Each is an integrated circuit fabricated using, for example, TSMC's 16 Nanometer semiconductor process such that each has a contact layer disposed above the substrate and below the metal layer. Each has a via between the contact layer and the power rail. The via connects the contact layer to the power rail. For example, in integrated circuits including a GPU, a contact layer is formed below the M1 level, and at least one via is disposed between the contact layer and the power rail such that the two are electrically connected.

125. In the '633 Accused Products said contact layer includes a first length disposed outside said diffusion region and a second length extending from said first length into said diffusion region and electrically connected to said transistor. The contact layer has a first length disposed outside the diffusion region. The contact layer includes a second length extending from the first length into the diffusion region. At least some of the second lengths are electrically connected to at least some of the transistors. For example, in integrated circuits including a GPU, the contact layer is formed such that it extends from outside the diffusion region to inside the diffusion region and electrically connects to at least some transistors.

126. On information and belief, TSMC actively, knowingly, and intentionally induces infringement of one or more claims of the '633 patent under 35 U.S.C. § 271(b) by actively encouraging others to import into the United States, and/or make, use, sell, and/or offer to sell in the United States, '633 Accused Products or products containing the infringing semiconductor components of the '633 Accused Products. For example, TSMC representatives travel to customer sites in the United States for sales and support activity that includes working with customers to facilitate these customers' infringing testing, marketing, importation, and sales activity. On information and belief, TSMC supplies customers with '633 Accused Products. Certain TSMC

semiconductor components are compatible with standards specific to the United States such as Code Division Multiple Access ("CDMA") wireless standards, required primarily for compatibility with major carriers in the United States. Additionally, the majority of TSMC's net revenue in 2018 was generated from contracts with customers in the United States. TSMC Annual Report 2018 (I) at 61. On information and belief, TSMC maintains internal projections and analyses of potential markets for specific end-user products, including for certain of the '633 Accused Products. TSMC additionally hosts an Open Innovation Platform Forum in the United States with the goal of facilitating partnerships and collaborations, in addition to an annual symposium and workshops across the United States. *Case Study: Open Innovation Platform*, Taiwan Semiconductor Manufacturing Company Ltd. Website, https://www.TSMC.com/csr/en/update/innovationAndService/caseStudy/1/index.html (last visited July 17, 2019); *Events*, Taiwan Semiconductor Manufacturing Company Ltd. Website, https://www.TSMC.com/english/newsEvents/events.htm (last visited July 17, 2019). TSMC leverages these events to publicize technological advances and design updates to potential customers and partners in the United States and provide training opportunities to facilitate familiarity with TSMC products, including '633 Accused Products.

127. By at least August 26, 2019, Globalfoundries disclosed, by sending a letter and filing this Complaint and other Complaints involving the Asserted Patents, the existence of the '633 patent and identified at least some of TSMC's and others' activities that infringe the '633 patent. Thus, based on this disclosure, TSMC had knowledge of the '633 patent and that its activities infringe the '633 patent since at least August 26, 2019. Based on Globalfoundries' disclosures, TSMC has also known or should have known since at least August 26, 2019 that its

customers, distributors, and other purchasers of the '633 Accused Products are infringing the '633 patent at least because TSMC has known that it is infringing the '633 patent.

128. On information and belief, since the filing of this Complaint, TSMC has continued to use, sell, and/or offer for sale the '633 Accused Products in the United States, and/or import the '633 Accused Products into the United States despite its knowledge of the '633 patent and its infringement of that patent, and has continued to induce infringement of the '633 patent. TSMC's on-going infringement is willful.

129. Other entities directly infringe the '633 patent by making, using, offering to sell, and/or selling at least some '633 Accused Products in the United States and by importing '633 Accused Products into the United States. For example, TSMC's customer MediaTek has infringed and continues to infringe one or more claims of the '633 patent, including at least claim 1, literally or under the doctrine of equivalents, at least under 35 U.S.C. § 271(a) by importing into the United States and/or using, and/or selling, and/or offering for sale in the United States, without authority or license, semiconductor devices fabricated using, for example, TSMC's 16 Nanometer process, such as MediaTek's Helio P22 SoCs (the "MediaTek '633 Accused Products"). On information and belief, MediaTek imports the MediaTek '633 Accused Products into the United States for sales and distribution to customers located in the United States, including sales and distribution through MediaTek USA Inc. On information and belief, MediaTek sells MediaTek '633 Accused Products in the United States. For example, MediaTek hires permanent sales personnel located throughout the United States. In particular, MediaTek has at least seven offices throughout the United States. On information and belief, each of these offices engages in sales activities. On information and belief, these sales activities include direct sales by MediaTek to original equipment manufacturers, including original equipment manufacturers based in the United States. On information and belief,

MediaTek offers the MediaTek '633 Accused Products for sale in the United States. For example, MediaTek engages in sales, marketing, and contracting activity in the United States and/or with United States offices of its customers.

130. On information and belief, MediaTek actively, knowingly, and intentionally induces infringement of one or more claims of the '633 patent under 35 U.S.C. § 271(b) by actively encouraging others to import into the United States, and/or make, use, sell, and/or offer to sell in the United States, MediaTek '633 Accused Products or products containing the infringing semiconductor components of the MediaTek '633 Accused Products. For example, MediaTek actively promotes the sale, use, and importation of the MediaTek '633 Accused Products in marketing materials, technical specifications, data sheets, white papers, product briefs, demonstrative videos, web pages on its website (www.mediatek.com), press releases, development platforms, online forums, and through its sales and distribution channels that encourage infringing uses, sales, offers to sell, and importation of the MediaTek '633 Accused Products. On information and belief, MediaTek supplies customers with MediaTek '633 Accused Products so that they may be used, sold, or offered for sale by those customers. MediaTek also seeks and obtains certifications from United States governmental organizations for MediaTek '633 Accused Products. For example, MediaTek's Helio P60 has been granted Federal Information Processing Standard ("FIPS") certification by the National Institute of Standards and Technology of the United States of America. As another example, certain MediaTek '633 Accused Products are compatible with standards specific to the United States such as Code Division Multiple Access ("CDMA") wireless standards, required primarily for compatibility with major carriers in the United States.

131. By at least August 26, 2019, Globalfoundries disclosed, by sending a letter and filing this Complaint, the existence of the '633 patent and identified at least some of MediaTek's and others' activities that infringe the '633 patent. Thus, based on this disclosure, MediaTek had knowledge of the '633 patent and that its activities infringe the '633 patent since at least August 26, 2019. Based on Globalfoundries' disclosures, MediaTek has also known or should have known since at least August 26, 2019 that its customers, distributors, and other purchasers of the MediaTek '633 Accused Products are infringing the '633 patent at least because MediaTek has known that it is infringing the '633 patent.

132. MediaTek's customers, for example BLU Products, Inc., have also infringed and continue to infringe one or more claims of the '633 patent, including at least claim 1, literally or under the doctrine of equivalents at least under 35 U.S.C. § 271(a) by importing into the United States and/or making, using, selling, and/or offering for sale in the United States, without any authority or license, smartphones, for example the VIVO XL4, that include MediaTek '633 Accused Products. These products are offered for sale at various retail locations throughout the United States.

133. Globalfoundries has suffered and continues to suffer damages as a result of Defendants' infringement of the '633 patent.

134. Defendants' continuing acts of infringement are a basis of consumer demand for the '633 Accused Products. Defendants' continuing acts of infringement are therefore irreparably harming and causing damage to Globalfoundries, for which Globalfoundries has no adequate remedy at law, and will continue to suffer such irreparable injury unless Defendants' continuing acts of infringement are enjoined by the Court. The hardships that an injunction would impose are

less than those faced by Globalfoundries should an injunction not issue. The public interest would be served by issuance of an injunction.

COUNT V
INFRINGEMENT OF THE '167 PATENT

135. Globalfoundries incorporates by reference the allegations set forth in paragraphs 1 through 134 as though fully set forth herein.

136. On information and belief, TSMC has infringed and continues to infringe and/or has induced infringement of one or more claims of the '167 patent, including at least claim 1, literally or under the doctrine of equivalents, by importing into the United States, and/or using, and/or selling, and/or offering for sale in the United States, without authority or license, integrated circuits manufactured by TSMC using, for example, TSMC's 16 Nanometer technology and products containing these integrated circuits (collectively, the "'167 Accused Products"), in violation of 35 U.S.C. § 271.

137. On information and belief, TSMC has directly infringed and continues to infringe at least claim 1 of the '167 patent literally or under the doctrine of equivalents, by importing into the United States, and/or using, and/or selling, and/or offering to sell in the United States, without authority or license, '167 Accused Products, in violation of 35 U.S.C. § 271(g). On information and belief, TSMC uses the '167 Accused Products through at least testing, evaluations, and demonstrations. For example, as part of its sales and customer-service activities TSMC performs infringing demonstrations, evaluations, and testing of the '167 Accused Products at customer sites in the United States, at TSMC's sites in the United States, and at TSMC's annual Technology Symposium and related workshops. On information and belief, TSMC imports the '167 Accused Products for the aforementioned uses. On information and belief, TSMC also imports the '167 Accused Products through its CyberShuttle and MOSIS MPW services. For example, TSMC

imports the '167 Accused Products for distribution to CyberShuttle customers located in the United States and imports the '167 Accused Products to MOSIS in Marina Del Ray, California. On information and belief, TSMC sells the '167 Accused Products. For example, TSMC sells '167 Accused Products to customers in the United States through its CyberShuttle MPW service. On information and belief, TSMC offers the Accused Products for sale. For example, TSMC engages in sales, marketing, and contracting activity in the United States and/or with United States offices of its customers.

138. The '167 Accused Products are manufactured by a process including all of the limitations of at least claim 1 of the '167 patent. Specifically, claim 1 of the '167 patent claims a method of forming a metal layer interface between a copper layer and a silicon nitride layer, the method comprising: providing a metal organic gas over a copper layer; forming a metal layer from reactions between the metal organic gas and the copper layer; and depositing a silicon nitride layer over the metal layer and copper layer, the metal layer providing an interface adhesion between the silicon nitride layer and the copper layer.

139. The '167 Accused Products are made by a method of forming a metal layer interface between a copper layer and a silicon nitride layer. TSMC's manufacture of the '167 Accused Products results in a metal layer interface. The metal layer interface is between a copper layer and a silicon nitride layer. On information and belief, TSMC uses a selective CVD cobalt process to perform this method.

140. During the manufacture of the '167 Accused Products a metal organic gas is provided over a copper layer. TSMC's manufacture of the '167 Accused Products provides a metal organic gas over a copper layer. On information and belief, TSMC uses a selective CVD cobalt process to perform this method.

141. During the manufacture of the '167 Accused Products, a metal layer is formed from reactions between the metal organic gas and the copper layer. TSMC's manufacture of the '167 Accused Products forms a cobalt metal layer from reactions between the metal organic gas and the copper layer. On information and belief, TSMC uses a selective CVD cobalt process to perform this method.

142. During the manufacture of the '167 Accused Products, a silicon nitride layer is deposited over the metal layer and the copper layer. On information and belief, TSMC's manufacture of the '167 Accused Products deposits a silicon nitride layer over the metal layer and the copper layer. On information and belief, TSMC uses a selective CVD cobalt process to perform this method.

143. During the manufacture of the '167 Accused Products, the metal layer provides an interface adhesion between the silicon nitride layer and the copper layer. TSMC's manufacture of the '167 Accused Products provides an interface adhesion between the silicon nitride layer and the copper layer. On information and belief, TSMC uses a selective CVD cobalt process to perform this method.

144. On information and belief, the '167 Accused Products are neither materially changed by subsequent processes nor become trivial and nonessential components of another product.

145. On information and belief, TSMC actively, knowingly, and intentionally induces infringement of one or more claims of the '167 patent under 35 U.S.C. § 271(b) by actively encouraging others to import into the United States, and/or use, sell, and/or offer to sell in the United States, '167 Accused Products or products containing the infringing semiconductor components of the '167 Accused Products. For example, TSMC representatives travel to customer

sites in the United States for sales and support activity that includes working with customers to facilitate these customers' infringing testing, marketing, importation, and sales activity. On information and belief, TSMC supplies customers with '167 Accused Products. Certain TSMC semiconductor components are compatible with standards specific to the United States such as Code Division Multiple Access ("CDMA") wireless standards, required primarily for compatibility with major carriers in the United States. Additionally, the majority of TSMC's net revenue in 2018 was generated from contracts with customers in the United States. TSMC Annual Report 2018 (I) at 61. On information and belief, TSMC maintains internal projections and analyses of potential markets for specific end-user products, including for certain of the '167 Accused Products. TSMC additionally hosts an Open Innovation Platform Forum in the United States with the goal of facilitating partnerships and collaborations, in addition to an annual symposium and workshops across the United States. *Case Study: Open Innovation Platform*, Taiwan Semiconductor Manufacturing Company Ltd. Website, https://www.TSMC.com/csr/en/update/innovationAndService/caseStudy/1/index.html (last visited July 17, 2019); *Events*, Taiwan Semiconductor Manufacturing Company Ltd. Website, https://www.TSMC.com/english/newsEvents/events.htm (last visited July 17, 2019). TSMC leverages these events to publicize technological advances and design updates to potential customers and partners in the United States and provide training opportunities to facilitate familiarity with TSMC products, including '167 Accused Products.

146. By at least August 26, 2019, Globalfoundries disclosed, by sending a letter and filing this Complaint and other Complaints involving the Asserted Patents, the existence of the '167 patent and identified at least some of TSMC's and others' activities that infringe the '167 patent. Thus, based on this disclosure, TSMC had knowledge of the '167 patent and that its

activities infringe the '167 patent since at least August 26, 2019. Based on Globalfoundries' disclosures, TSMC has also known or should have known since at least August 26, 2019 that its customers, distributors, and other purchasers of the '167 Accused Products are infringing the '167 patent at least because TSMC has known that it is infringing the '167 patent.

147. On information and belief, since the filing of this Complaint, TSMC has continued to use, sell, and/or offer for sale the '167 Accused Products in the United States, and/or import the '167 Accused Products into the United States despite its knowledge of the '167 patent and its infringement of that patent, and has continued to induce infringement of the '167 patent. TSMC's on-going infringement is willful.

148. Other entities directly infringe the '167 patent by making, using, offering to sell, and/or selling at least some '167 Accused Products in the United States and by importing '167 Accused Products into the United States. For example, TSMC's customer MediaTek has infringed and continues to infringe one or more claims of the '167 patent, including claim 1, literally or under the doctrine of equivalents at least under 35 U.S.C. § 271(g) by importing into the United States and/or using, selling, and/or offering for sale in the United States, without any authority or license, semiconductor devices fabricated using, for example, TSMC's 16 Nanometer process, such as MediaTek's Helio P22 SoCs (the "MediaTek '167 Accused Products"). On information and belief, MediaTek imports MediaTek '167 Accused Products into the United States for sales and distribution to customers located in the United States, including sales and distribution through MediaTek USA Inc. On information and belief, MediaTek sells MediaTek '167 Accused Products in the United States. For example, MediaTek hires permanent sales personnel located throughout the United States. In particular, MediaTek has at least seven offices throughout the United States. On information and belief, each of these offices engages in sales activities. On information and

belief, these sales activities include direct sales by MediaTek to original equipment manufacturers, including original equipment manufacturers based in the United States. On information and belief, MediaTek offers the MediaTek '167 Accused Products for sale in the United States. For example, MediaTek engages in sales, marketing, and contracting activity in the United States and/or with United States offices of its customers.

149. On information and belief, MediaTek actively, knowingly, and intentionally induces infringement of one or more claims of the '167 patent under 35 U.S.C. § 271(b) by actively encouraging others to import into the United States, and/or use, sell, and/or offer to sell in the United States, MediaTek '167 Accused Products or products containing the infringing semiconductor components of the MediaTek '167 Accused Products. For example, MediaTek actively promotes the sale, use, and importation of the MediaTek '167 Accused Products in marketing materials, technical specifications, data sheets, white papers, product briefs, demonstrative videos, web pages on its website (www.mediatek.com), press releases, development platforms, online forums, and through its sales and distribution channels that encourage infringing uses, sales, offers to sell, and importation of the MediaTek '167 Accused Products. On information and belief, MediaTek supplies customers with MediaTek '167 Accused Products so that they may be used, sold, or offered for sale by those customers. MediaTek also seeks and obtains certifications from United States governmental organizations for MediaTek '167 Accused Products. For example, MediaTek's Helio P60 has been granted Federal Information Processing Standard ("FIPS") certification by the National Institute of Standards and Technology of the United States of America. As another example, certain MediaTek '167 Accused Products are compatible with standards specific to the United States such as Code Division Multiple Access

("CDMA") wireless standards, required primarily for compatibility with major carriers in the United States.

150. By at least August 26, 2019, Globalfoundries disclosed, by sending a letter and filing this Complaint, the existence of the '167 patent and identified at least some of MediaTek's and others' activities that infringe the '167 patent. Thus, based on this disclosure, MediaTek had knowledge of the '167 patent and that its activities infringe the '167 patent since at least August 26, 2019. Based on Globalfoundries' disclosures, MediaTek has also known or should have known since at least August 26, 2019 that its customers, distributors, and other purchasers of the MediaTek '167 Accused Products are infringing the '167 patent at least because MediaTek has known that it is infringing the '167 patent.

151. MediaTek's customers, for example, BLU Products, Inc., have also infringed and continue to infringe one or more claims of the '167 patent, including claim 1, literally or under the doctrine of equivalents at least under 35 U.S.C. § 271(g) by importing into the United States and/or using, selling, and/or offering for sale in the United States, without any authority or license, smartphones, for example the VIVO XL4, that include MediaTek '167 Accused Products. These products are offered for sale at various retail locations throughout the United States.

152. Globalfoundries has suffered and continues to suffer damages as a result of Defendants' infringement of the '167 patent.

153. Defendants' continuing acts of infringement are a basis of consumer demand for the '167 Accused Products. Defendants' continuing acts of infringement are therefore irreparably harming and causing damage to Globalfoundries, for which Globalfoundries has no adequate remedy at law, and will continue to suffer such irreparable injury unless Defendants' continuing acts of infringement are enjoined by the Court. The hardships that an injunction would impose are

less than those faced by Globalfoundries should an injunction not issue. The public interest would be served by issuance of an injunction.

COUNT VI
INFRINGEMENT OF THE '966 PATENT

154. Globalfoundries incorporates by reference the allegations set forth in paragraphs 1 through 153 as though fully set forth herein.

155. On information and belief, TSMC has infringed and continues to infringe and/or has induced infringement of one or more claims of the '966 patent, including at least claim 12, literally or under the doctrine of equivalents, by importing into the United States and/or using, and/or selling, and/or offering for sale in the United States, without authority or license, integrated circuits manufactured by TSMC using, for example, TSMC's 16 Nanometer technology and products containing these integrated circuits (collectively, the "'966 Accused Products"), in violation of 35 U.S.C. § 271.

156. On information and belief, TSMC has directly infringed and continues to infringe one or more claims of the '966 patent, including at least claim 12, literally or under the doctrine of equivalents, by importing into the United States, and/or using, and/or selling, and/or offering to sell in the United States, without authority or license, '966 Accused Products, in violation of 35 U.S.C. § 271(a) and (g). On information and belief, TSMC uses the '966 Accused Products through at least testing, evaluations, and demonstrations. For example, as part of its sales and customer-service activities TSMC performs infringing demonstrations, evaluations, and testing of the '966 Accused Products at customer sites in the United States, at TSMC's sites in the United States, and at TSMC's annual Technology Symposium and related workshops. On information and belief, TSMC imports the '966 Accused Products for the aforementioned uses. On information and belief, TSMC also imports the '966 Accused Products through its CyberShuttle and MOSIS

MPW services. For example, TSMC imports the '966 Accused Products for distribution to CyberShuttle customers located in the United States and imports the '966 Accused Products to MOSIS in Marina Del Ray, California. On information and belief, TSMC sells the '966 Accused Products. For example, TSMC sells '966 Accused Products to customers in the United States through its CyberShuttle MPW service. On information and belief, TSMC offers the '966 Accused Products for sale. For example, TSMC engages in sales, marketing, and contracting activity in the United States and/or with United States offices of its customers.

157. The '966 Accused Products meet all the limitations of at least claim 12 of the '966 patent. Specifically, claim 12 of the '966 patent claims a structure, comprising: a wire embedded in a dielectric layer on a semiconductor substrate, said wire comprising a copper core and an electrically conductive liner on sidewalls and a bottom of said copper core, said copper core and said electrically conductive liner exposed at a top surface of said dielectric layer; a metal cap on an entire top surface of said copper core; a dielectric cap only over (i) said metal cap, (ii) any exposed portions of said liner, and (iii) on said top surface of said dielectric layer; and wherein an interface between said copper core and said metal layer does not contain oxygen.

158. The '966 Accused Products are structures. Each is an integrated circuit fabricated using, for example, TSMC's 16 Nanometer semiconductor process.

159. The '966 Accused Products have a wire embedded on a dielectric layer on a semiconductor substrate. Each is an integrated circuit fabricated using, for example, TSMC's 16 Nanometer semiconductor process such that there is a dielectric layer on a semiconductor substrate. For example, at least some of the '966 Accused Products have a SiOC dielectric layer on a semiconductor substrate. The '966 Accused Products have a wire embedded in the dielectric layer as part of, for example, the M1-M3 interconnects.

160. The ’966 Accused Products have a wire that has a copper core and an electrically conductive liner on sidewalls and a bottom of said copper core. Each contains wires with copper cores, for example as part of the M1-M3 interconnects. At least some of those wires have an electrically conductive liner including, for example, tantalum and cobalt, on the sidewalls and bottom of the copper core. Tantalum and cobalt are electrically conductive.

161. The ’966 Accused Products have a wire that has a copper core and an electrically conductive liner exposed at the top surface of said dielectric layer. In the ’966 Accused Products, in at least some instances, the copper core, electrically conductive liner including cobalt and tantalum are exposed at the top surface of the dielectric layer of, for example, at least one of the M1-M3 interconnect layers.

162. The ’966 Accused Products have a metal cap on an entire top surface of said copper core. In the ’966 Accused Products, at least some the wires have a cobalt cap on the entire top surface of the copper core. Cobalt is a metal.

163. The ’966 Accused Products have a dielectric cap only over said metal cap, any exposed portions of said liner, and on said top surface of said dielectric layer. In the ’966 Accused Products at least some of the wires have, for example, a SiNC dielectric cap that covers only the cobalt metal cap, any exposed portions of the conductive liner, and the top surface of the SiOC dielectric layer.

164. The ’966 Accused Products have a structure wherein an interface between said copper core and said metal layer does not contain oxygen. In the ’966 Accused Products, the interface between the copper core and the cobalt cap of at least some of the wires contains no oxygen.

165. On information and belief, the '966 Accused Products are neither materially changed by subsequent processes nor become trivial and nonessential components of another product.

166. On information and belief, TSMC actively, knowingly, and intentionally induces infringement of one or more claims of the '966 patent under 35 U.S.C. § 271(b) by actively encouraging others to import into the United States, and/or make, use, sell, and/or offer to sell in the United States, '966 Accused Products or products containing the infringing semiconductor components of the '966 Accused Products. For example, TSMC representatives travel to customer sites in the United States for sales and support activity that includes working with customers to facilitate these customers' infringing testing, marketing, importation, and sales activity. On information and belief, TSMC supplies customers with '966 Accused Products. Certain TSMC semiconductor components are compatible with standards specific to the United States such as Code Division Multiple Access ("CDMA") wireless standards, required primarily for compatibility with major carriers in the United States. Additionally, the majority of TSMC's net revenue in 2018 was generated from contracts with customers in the United States. TSMC Annual Report 2018 (I) at 61. On information and belief, TSMC maintains internal projections and analyses of potential markets for specific end-user products, including for certain of the '966 Accused Products. TSMC additionally hosts an Open Innovation Platform Forum in the United States with the goal of facilitating partnerships and collaborations, in addition to an annual symposium and workshops across the United States. *Case Study: Open Innovation Platform*, Taiwan Semiconductor Manufacturing Company Ltd. Website, https://www.TSMC.com/csr/en/update/innovationAndService/caseStudy/1/index.html (last visited July 17, 2019); *Events*, Taiwan Semiconductor Manufacturing Company Ltd. Website,

https://www.TSMC.com/english/newsEvents/events.htm (last visited July 17, 2019). TSMC leverages these events to publicize technological advances and design updates to potential customers and partners in the United States and provide training opportunities to facilitate familiarity with TSMC products, including '966 Accused Products.

167. By at least August 26, 2019, Globalfoundries disclosed, by sending a letter and filing this Complaint and other Complaints involving the Asserted Patents, the existence of the '966 patent and identified at least some of TSMC's and others' activities that infringe the '966 patent. Thus, based on this disclosure, TSMC had knowledge of the '966 patent and that its activities infringe the '966 patent since at least August 26, 2019. Based on Globalfoundries' disclosures, TSMC has also known or should have known since at least August 26, 2019 that its customers, distributors, and other purchasers of the '966 Accused Products are infringing the '966 patent at least because TSMC has known that it is infringing the '966 patent.

168. On information and belief, since the filing of this Complaint, TSMC has continued to use, sell, and/or offer for sale the '966 Accused Products in the United States, and/or import the '966 Accused Products into the United States despite its knowledge of the '966 patent and its infringement of that patent, and has continued to induce infringement of the '966 patent. TSMC's on-going infringement is willful.

169. Other entities directly infringe the '966 patent by making, using, offering to sell, and/or selling at least some '966 Accused Products in the United States and by importing '966 Accused Products into the United States. For example, TSMC's customer MediaTek has infringed and continues to infringe one or more claims of the '966 patent, including at least claim 12, literally or under the doctrine of equivalents, at least under 35 U.S.C. § 271(a) and (g), by importing into the United States and/or using, and/or selling, and/or offering for sale in the United States, without

authority or license, semiconductor devices fabricated using, for example, TSMC's 16 Nanometer process, such as MediaTek's Helio P22 SoCs (the "MediaTek '966 Accused Products"). On information and belief, MediaTek imports the MediaTek '966 Accused Products into the United States for sales and distribution to customers located in the United States, including sales and distribution through MediaTek USA Inc. On information and belief, MediaTek sells MediaTek '966 Accused Products in the United States. For example, MediaTek hires permanent sales personnel located throughout the United States. In particular, MediaTek has at least seven offices throughout the United States. On information and belief, each of these offices engages in sales activities. On information and belief, these sales activities include direct sales by MediaTek to original equipment manufacturers, including original equipment manufacturers based in the United States. On information and belief, MediaTek offers the MediaTek '966 Accused Products for sale in the United States. For example, MediaTek engages in sales, marketing, and contracting activity in the United States and/or with United States offices of its customers.

170. On information and belief, MediaTek actively, knowingly, and intentionally induces infringement of one or more claims of the '966 patent under 35 U.S.C. § 271(b) by actively encouraging others to import into the United States, and/or make, use, sell, and/or offer to sell in the United States, MediaTek '966 Accused Products or products containing the infringing semiconductor components of the MediaTek '966 Accused Products. For example, MediaTek actively promotes the sale, use, and importation of the MediaTek '966 Accused Products in marketing materials, technical specifications, data sheets, white papers, product briefs, demonstrative videos, web pages on its website (www.mediatek.com), press releases, development platforms, online forums, and through its sales and distribution channels that encourage infringing uses, sales, offers to sell, and importation of the MediaTek '966 Accused Products. On information

and belief, MediaTek supplies customers with MediaTek '966 Accused Products so that they may be used, sold, or offered for sale by those customers. MediaTek also seeks and obtains certifications from United States governmental organizations for MediaTek '966 Accused Products. For example, MediaTek's Helio P60 has been granted Federal Information Processing Standard ("FIPS") certification by the National Institute of Standards and Technology of the United States of America. As another example, certain MediaTek '966 Accused Products are compatible with standards specific to the United States such as Code Division Multiple Access ("CDMA") wireless standards, required primarily for compatibility with major carriers in the United States.

171. By at least August 26, 2019, Globalfoundries disclosed, by sending a letter and filing this Complaint, the existence of the '966 patent and identified at least some of MediaTek's and others' activities that infringe the '966 patent. Thus, based on this disclosure, MediaTek had knowledge of the '966 patent and that its activities infringe the '966 patent since at least August 26, 2019. Based on Globalfoundries' disclosures, MediaTek has also known or should have known since at least August 26, 2019 that its customers, distributors, and other purchasers of the MediaTek '966 Accused Products are infringing the '966 patent at least because MediaTek has known that it is infringing the '966 patent.

172. MediaTek's customers, for example BLU Products, Inc., have also infringed and continue to infringe one or more claims of the '966 patent, including at least claim 12, literally or under the doctrine of equivalents at least under 35 U.S.C. § 271(a) and (g) by importing into the United States and/or making, using, selling, and/or offering for sale in the United States, without any authority or license, smartphones, for example the VIVO XL4, that include MediaTek '966

Accused Products. These products are offered for sale at various retail locations throughout the United States.

173. Globalfoundries has suffered and continues to suffer damages as a result of Defendants' infringement of the '966 patent.

174. Defendants' continuing acts of infringement are a basis of consumer demand for the '966 Accused Products. Defendants' continuing acts of infringement are therefore irreparably harming and causing damage to Globalfoundries, for which Globalfoundries has no adequate remedy at law, and will continue to suffer such irreparable injury unless Defendants' continuing acts of infringement are enjoined by the Court. The hardships that an injunction would impose are less than those faced by Globalfoundries should an injunction not issue. The public interest would be served by issuance of an injunction.

JURY DEMAND

175. Plaintiff demands a jury trial as to all issues that are triable by a jury in this action.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff respectfully prays for relief as follows:

(a) Judgment that each Defendant is liable for infringement and/or inducing the infringement of one or more claims of each of the Asserted Patents;

(b) An Order permanently enjoining Defendants and their respective officers, agents, employees, and those acting in privity or in active concert or participation with them, from further infringement of the Asserted Patents;

(c) Compensatory damages in an amount according to proof, including lost profits, and in any event no less than a reasonable royalty;

(d) Pre-judgment interest;

(e) Post-judgment interest;

(f) Attorneys' fees based on this being an exceptional case pursuant to 35 U.S.C. § 285, including pre-judgment interest on such fees;

(g) An accounting and/or supplemental damages for all damages occurring after any discovery cutoff and through final judgment;

(h) Costs and expenses in this action; and

(i) Any further relief that the Court deems just and proper.

Dated: August 26, 2019

Respectfully submitted,

/s/ Raymond W. Mort, III

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